

**What is claimed:**

1. A digital packet data network for transporting packetized voice and data signals in the local loop between a central office switch and a plurality of local users, wherein the data signals comprise data packets, comprising:

5 a first converter located at the central office for converting the voice signals into packets;  
a second converter located remotely from the central office and in the vicinity of the local users for converting the voice packets into voice signals; and  
a packet-switched network connected between the first and second converters for transporting the voice and data packets to and from the plurality of local users.

2. The digital packet data network of claim 1, further comprising:

interface circuitry for coupling the first converter to information sources that provide the voice and data signals.

15 3. The digital packet data network of claim 1, wherein the first converter converts the voice signals into a packet format having addressing that enables layer-2 switching.

4. The digital packet data network of claim 1, further comprising:

20 a third converter located at the central office for converting the data packets into a format that is similar to the voice packets created by the first converter.

5. The digital packet data network of claim 1, wherein the packet switched network is an Ethernet data network.

6. The digital packet data network of claim 5, wherein the packet switched network includes a plurality of Ethernet switching devices.

7. The digital packet data network of claim 6, wherein at least one Ethernet switching device is located at the central office, and at least one other Ethernet switching device is located remotely from the central office.

8. The digital packet data network of claim 1, wherein the packet switched network comprises a dual-pipelined network for separately transporting the voice and data packets.

9. The digital packet data network of claim 1, wherein the voice and data packets are separately transported between the central office and the plurality of local users.

10. The digital packet data network of claim 1, wherein the packet switched network comprises:  
at least one remote cabinet including a packet switching device; and  
a plurality of remote access devices coupled to the packet switching device and including the second converter.

11. The digital packet data network of claim 10, wherein the at least one remote cabinet includes two input ports for separately receiving voice and data packets from the central office.

12. The digital packet data network of claim 11, wherein the at least one remote cabinet includes a plurality of interface unit cards that multiplex voice and data packets onto a single output.

13. The digital packet data network of claim 12, wherein the single outputs of the interface unit cards are each coupled via a single fiber connection to a remote access device.

14. The digital packet data network of claim 1, further comprising:

5           means for synchronizing the converted voice signals at the second converter to a local digital switch at the central office.

15. The digital packet data network of claim 1, wherein the means for synchronizing comprises:

          means for deriving time-synchronization information from the local digital switch at the central office location on a periodic basis;

          means for converting the time synchronization information into a time synchronization packet;

          means for transporting the time synchronization packet to a user access device associated with the second converter; and

15           means for locking the time clock of the local access device to the local digital switch using the time synchronization packet.

16. A local loop access network, comprising:

          a central telephony gateway coupled to a plurality of information sources;

20           a remote telephony gateway coupled to a plurality of user access devices; and

          a digital packet data network connected between the central telephony gateway and the remote telephony gateway for transporting information between the plurality of information sources and the local access devices.

17. An access network for transporting voice and data signals between a plurality of local access devices and a central location, comprising:

means for converting the voice and data signals generated by the local access devices into packets;

5 packet network means for transporting the voice and data packets to the central location;

and

means for converting the voice and data packets transported by the packet network means into voice and data signals at the central location.

18. A method of transporting voice and data signals in the local access loop, comprising:

receiving voice and data signals at a central location;

converting the voice and data signals into a common digital packet format;

transporting the voice and data packets to a plurality of local access devices using a digital packet switched network; and

15 converting the voice and data packets into voice and data signals at the local access devices.

19. A dual-pipeline digital packet data access network for transporting voice and data signals between a central office switch and a plurality of local access devices, comprising:

20 a packet converter located at the central office switch for converting voice signals and data signals into a common digital packet format;

a voice packet pipeline connected between the central office switch and the plurality of local access devices for transporting the voice signals; and

a data packet pipeline connected between the central office switch and the plurality of local access devices for transporting the data signals.

20. A method of time-synchronizing voice signals in a local loop digital packet network connected between a central office location and a plurality of user access devices, comprising:

deriving time-synchronization information from a local digital switch at the central office location on a periodic basis;

converting the time synchronization information into a time synchronization packet;

transporting the time synchronization packet to the plurality of user access devices; and

locking the time clock of the local access device to the local digital switch using the time synchronization packet.

21. A packet network for transporting voice signals in the local access loop, comprising:

a central telephony gateway located at a central office location for interfacing to a source of voice signal information;

a plurality of remote telephony gateways located remotely from the central office for interfacing to a plurality of local user access devices; and

a packet-switched network coupled between the central telephony gateway and the plurality of remote telephony gateways for transporting the voice signal information to and from the plurality of local user access devices.

22. The packet network of claim 21, wherein the central telephony gateway is further interfaced to a source of data signal information, and wherein the packet-switched network is

further for transporting the data signal information to and from the plurality of local user access devices.

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